

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. **(Currently amended)** An interaction site prediction apparatus comprising:
  - an input unit that inputs primary sequence information on a target protein;
  - a fragment structure prediction program execution unit that allows a plurality of fragment structure prediction ~~program~~ programs for predicting a fragment structure of the target protein from the primary sequence information on the target protein to execute a fragment structure prediction simulation to the primary sequence information input by the input unit;
  - a prediction result comparison unit that compares a fragment structure prediction ~~result~~ results of the fragment structure prediction ~~program~~ programs allowed to execute by the fragment structure prediction program execution unit with the fragment structure prediction result of the other fragment structure prediction program;
  - a frustration calculation unit that calculates a frustration of a local part of the primary sequence information on the target protein based on a comparison result of the prediction result comparison unit; and
  - an interaction site prediction unit that predicts an interaction site in the target protein based on the frustration of the local part calculated by the frustration calculation unit.
2. **(Currently amended)** An interaction site prediction apparatus comprising:
  - an input unit that inputs primary sequence information on a target protein;
  - a tertiary structure data acquisition unit that acquires tertiary structure data on the target protein;
  - a fragment structure prediction program execution unit that allows a plurality of fragment structure prediction ~~program~~ programs for predicting a fragment structure of the target protein from the primary sequence information on the target

protein to execute a fragment structure prediction simulation to the primary sequence information input by the input unit;

a prediction result comparison unit that compares a fragment structure prediction ~~result~~ results of the fragment structure prediction ~~program~~ programs allowed to execute by the fragment structure prediction program execution unit with the tertiary structure data acquired by the tertiary structure data acquisition unit;

a frustration calculation unit that calculates a frustration of a local part of the primary sequence information on the target protein based on a comparison result of the prediction result comparison unit; and

an interaction site prediction unit that predicts an interaction site in the target protein based on the frustration of the local part calculated by the frustration calculation unit.

3. **(Currently amended)** The interaction site prediction apparatus according to claim 1 ~~[[or 2]]~~, further comprising:

a certainty factor information setting unit that sets certainty factor information indicating a certainty factor for the fragment structure prediction result of the fragment structure prediction program, wherein

the frustration calculation unit calculates the frustration of the local part based on the certainty factor information set by the certainty factor information setting unit and on the comparison result.

4. **(Currently amended)** An interaction site prediction method comprising:

an input step that inputs primary sequence information on a target protein;

a fragment structure prediction program execution step that allows a plurality of fragment structure prediction ~~program~~ programs for predicting a fragment structure of the target protein from the primary sequence information on the target protein to execute a fragment structure prediction simulation to the primary sequence information input by the input step;

a prediction result comparison step that compares a fragment structure prediction ~~result~~ results of the fragment structure prediction ~~program~~ programs

allowed to execute by the fragment structure prediction program execution step with the fragment structure prediction result of the other fragment structure prediction program;

a frustration calculation step that calculates a frustration of a local part of the primary sequence information on the target protein based on a comparison result of the prediction result comparison step; and

an interaction site prediction step that predicts an interaction site in the target protein based on the frustration of the local part calculated by the frustration calculation step.

5. **(Currently amended)** An interaction site prediction method comprising:  
an input step that inputs primary sequence information on a target protein;  
a tertiary structure data acquisition step that acquires tertiary structure data on the target protein;

a fragment structure prediction program execution step that allows a plurality of fragment structure prediction ~~program~~ programs for predicting a fragment structure of the target protein from the primary sequence information on the target protein to execute a fragment structure prediction simulation to the primary sequence information input by the input step;

a prediction result comparison step that compares a fragment structure prediction ~~result~~ results of the fragment structure prediction ~~program~~ programs allowed to execute by the fragment structure prediction program execution step with the tertiary structure data acquired by the tertiary structure data acquisition step;

a frustration calculation step that calculates a frustration of a local part of the primary sequence information on the target protein based on a comparison result of the prediction result comparison step; and

an interaction site prediction step that predicts an interaction site in the target protein based on the frustration of the local part calculated by the frustration calculation step.

6. **(Currently amended)** The interaction site prediction method according to claim 4 ~~[[or 5]]~~, further comprising:

a certainty factor information setting step that sets certainty factor information indicating a certainty factor for the fragment structure prediction result of the fragment structure prediction program, wherein

the frustration calculation step calculates the frustration of the local part based on the certainty factor information set by the certainty factor information setting step and on the comparison result.

7. **(Currently amended)** A computer program that makes a computer to execute an interaction site prediction method comprising:

an input step that inputs primary sequence information on a target protein;

a fragment structure prediction program execution step that allows a plurality of fragment structure prediction ~~program~~ programs for predicting a fragment structure of the target protein from the primary sequence information on the target protein to execute a fragment structure prediction simulation to the primary sequence information input by the input step;

a prediction result comparison step that compares a fragment structure prediction ~~result~~ results of the fragment structure prediction ~~program~~ programs allowed to execute by the fragment structure prediction program execution step with the fragment structure prediction result of the other fragment structure prediction program;

a frustration calculation step that calculates a frustration of a local part of the primary sequence information on the target protein based on a comparison result of the prediction result comparison step; and

an interaction site prediction step that predicts an interaction site in the target protein based on the frustration of the local part calculated by the frustration calculation step.

8. **(Currently amended)** A computer program that makes a computer to execute an interaction site prediction method comprising:

an input step that inputs primary sequence information on a target protein;  
a tertiary structure data acquisition step that acquires tertiary structure data on the target protein;

a fragment structure prediction program execution step that allows a plurality of fragment structure prediction ~~program~~ programs for predicting a fragment structure of the target protein from the primary sequence information on the target protein to execute a fragment structure prediction simulation to the primary sequence information input by the input step;

a prediction result comparison step that compares a fragment structure prediction ~~result~~ results of the fragment structure prediction ~~program~~ programs allowed to execute by the fragment structure prediction program execution step with the tertiary structure data acquired by the tertiary structure data acquisition step;

a frustration calculation step that calculates a frustration of a local part of the primary sequence information on the target protein based on a comparison result of the prediction result comparison step; and

an interaction site prediction step that predicts an interaction site in the target protein based on the frustration of the local part calculated by the frustration calculation step.

9. **(Currently amended)** The program comprising according to claim 7 ~~[[or 8]]~~, further comprising:

a certainty factor information setting step that sets certainty factor information indicating a certainty factor for the fragment structure prediction result of the fragment structure prediction program, wherein

the frustration calculation step calculates the frustration of the local part based on the certainty factor information set by the certainty factor information setting step and on the comparison result.

10. **(Currently amended)** A computer readable recording medium storing a computer program that makes a computer to execute an interaction site prediction method comprising:

an input step that inputs primary sequence information on a target protein;  
a fragment structure prediction program execution step that allows a plurality of fragment structure prediction ~~program~~ programs for predicting a fragment structure of the target protein from the primary sequence information on the target protein to execute a fragment structure prediction simulation to the primary sequence information input by the input step;  
a prediction result comparison step that compares a fragment structure prediction ~~result~~ results of the fragment structure prediction ~~program~~ programs allowed to execute by the fragment structure prediction program execution step with the fragment structure prediction result of the other fragment structure prediction program;  
a frustration calculation step that calculates a frustration of a local part of the primary sequence information on the target protein based on a comparison result of the prediction result comparison step; and  
an interaction site prediction step that predicts an interaction site in the target protein based on the frustration of the local part calculated by the frustration calculation step.

11. **(Currently amended)** A computer readable recording medium storing a computer program that makes a computer to execute an interaction site prediction method comprising:

an input step that inputs primary sequence information on a target protein;  
a tertiary structure data acquisition step that acquires tertiary structure data on the target protein;  
a fragment structure prediction program execution step that allows a plurality of fragment structure prediction ~~program~~ programs for predicting a fragment structure of the target protein from the primary sequence information on the target protein to execute a fragment structure prediction simulation to the primary sequence information input by the input step;  
a prediction result comparison step that compares a fragment structure prediction ~~result~~ results of the fragment structure prediction ~~program~~ programs

allowed to execute by the fragment structure prediction program execution step with the tertiary structure data acquired by the tertiary structure data acquisition step;

a frustration calculation step that calculates a frustration of a local part of the primary sequence information on the target protein based on a comparison result of the prediction result comparison step; and

an interaction site prediction step that predicts an interaction site in the target protein based on the frustration of the local part calculated by the frustration calculation step.

12. **(Currently amended)** The computer readable recording medium according to claim 10 ~~[[or 11]]~~, further comprising:

a certainty factor information setting step that sets certainty factor information indicating a certainty factor for the fragment structure prediction result of the fragment structure prediction program, wherein

the frustration calculation step calculates the frustration of the local part based on the certainty factor information set by the certainty factor information setting step and on the comparison result.

13. **(New)** The interaction site prediction apparatus according to claim 2, further comprising:

a certainty factor information setting unit that sets certainty factor information indicating a certainty factor for the fragment structure prediction result of the fragment structure prediction program, wherein

the frustration calculation unit calculates the frustration of the local part based on the certainty factor information set by the certainty factor information setting unit and on the comparison result.

14. **(New)** The interaction site prediction method according to claim 5, further comprising:

a certainty factor information setting step that sets certainty factor information indicating a certainty factor for the fragment structure prediction result of the fragment structure prediction program, wherein

the frustration calculation step calculates the frustration of the local part based on the certainty factor information set by the certainty factor information setting step and on the comparison result.

15. **(New)** The program comprising according to claim 8, further comprising:

a certainty factor information setting step that sets certainty factor information indicating a certainty factor for the fragment structure prediction result of the fragment structure prediction program, wherein

the frustration calculation step calculates the frustration of the local part based on the certainty factor information set by the certainty factor information setting step and on the comparison result.

16. **(New)** The computer readable recording medium according to claim 11, further comprising:

a certainty factor information setting step that sets certainty factor information indicating a certainty factor for the fragment structure prediction result of the fragment structure prediction program, wherein

the frustration calculation step calculates the frustration of the local part based on the certainty factor information set by the certainty factor information setting step and on the comparison result.